

Environmental Assessment

for

Muddy Creek Spike

Prepared by

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Bureau of Land Management

Pinedale Field Office

Pinedale, Wyoming

DOI-BLM-WY-100-EA11-192



1.0 INTRODUCTION

Muddy Creek Spike

EA Number: WY-100-EA11-192

Introduction:

The proposed vegetation treatment lies within the western portion of the Muddy Creek watershed and, approximately 10 miles southwest of La Barge, Wyoming in Lincoln County. The proposed treatment would occur 100% on public land administered by the Pinedale BLM Field Office. Terrain varies from gentle to steep slopes, with elevation ranging from 6800 to 7300 feet with mixed aspects. Precipitation ranges from 10-12 inches annually, primarily coming as winter snow and spring-summer rains. The proposed project area landscape is dominated by mountain big sagebrush with pockets of mountain mahogany, antelope bitterbrush, and intermixed with grasses, forbs, and other shrubs.

Bureau of Land Management Field Office: Pinedale, Wyoming, LLWYD01000

1.1 Purpose and Need for the Proposed Action

The purpose of the proposed action is to reduce the cover of sagebrush and to increase herbaceous vegetative cover and production, and improve the diversity of species composition and the age-class structure of big sagebrush and mountain shrubs. Benefits would include increased forage quantity and quality for wildlife and livestock, and specifically improve winter and transitional habitat for mule deer. Overall, the proposed action would contribute to the achievement of standards for healthy rangelands and desired plant communities (DPC) for mule deer, elk, and other wildlife species.

The need for the proposed action is to thin dense, mature to decadent stands of sagebrush to improve seasonal habitat for wildlife and overall rangeland health. Habitat quality in the project area has decreased due to shrub over-maturity and/or decadence, and the lack of structural and age stratification. Competition from a dense sagebrush overstory restricts availability of water and nutrients to other desirable plants. This has reduced the amount, vigor, and nutritional quality of grasses, forbs, and other shrubs important for wildlife and livestock during various use

periods. Watershed health has declined due to the loss of herbaceous (grass and forb) understory and overall ground cover on upland sites, and encroachment of sagebrush into riparian habitat.

1.2 Relationship to Statutes, Regulations, Plans or Other Environmental Analyses

This proposal is subject to the following land use plan:

Name of Plan: Pinedale RMP Date Approved: November 26, 2008

This plan has been reviewed to determine if the proposed action conforms to the land use plan terms and conditions as required by 43CFR 1610.5. The proposed action conforms to the Vegetation Management Goals on Page 2-37 of the Record of Decision and Approved Resource Management Plan, which include:

“Maintain and/or enhance native vegetation community health, composition, and diversity in conformance with Wyoming Standards for Rangeland Health.”

The RMP, under Fire Management, also includes the goal to:

“Maintain a landscape of diverse plant communities and successional stages that would have been produced by historic fire regimes.”(page 2-44).

Under Livestock Grazing Management Goals it states:

“Maintain and/or enhance livestock grazing opportunities and rangeland health” (page 2-17).

Under Wildlife Habitat and Fisheries Management Goals it states:

“Maintain functioning big game habitats and migration corridors that allow free movement and use of habitats” (page 2-45).

This environmental assessment tiers off of the Final Environmental Impact Statement (FEIS) on the Vegetation Treatment on BLM Lands, (US DOI 1991). This FEIS considered and evaluated the impacts of the Bureau's vegetation treatment program from a mix of alternative methods of treatment including burning, biological, mechanical, manual, and chemical. It approved use of tebuthiuron as one of many EPA registered chemicals approved for use. The EPA has found that tebuthiuron poses no unreasonable risk to human health or the environment in light of the

benefits of its use. This environmental assessment is also in conformance with the Vegetation Treatments using Herbicides Final Environmental Impact Statement (FEIS), June 2007. In this document, use of previously approved chemicals (including tebuthiuron) was continued, following more intensive documentation of long-term impacts and risk analysis since the earlier FEIS. Findings from this FEIS have been incorporated into the current environmental assessment.

In addition, this environmental assessment is in conformance with the South La Barge Common Allotment Management Plan that was implemented in 1992.

The proposed action is consistent with state and local government programs, plans, zoning and applicable regulations.

1.3 Scoping and Issues

A public/external scoping letter was mailed to interested parties on May 3, 2011. Two public comments were received regarding the Muddy Creek spike project. Issues raised by one commenter referred mainly to the analysis of soils, control of livestock, invasion of weeds, and monitoring. The proposed action incorporates a soil analysis that was used to determine proper tebuthiuron application rates. Livestock would be fenced out of the treatment for two years. No known invasive or noxious weeds within the treatment polygons. The proposed application rates should not allow for weeds to spread into the project area any faster than they might under the no action alternative. To address the monitoring concerns, the proposed action incorporates pre and post treatment monitoring into the proposal. The other commenter highly supported the project for its benefits to mule deer in the Muddy Creek Drainage. There were general suggestions about site location and application rates that were incorporated into the EA analysis.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Alternative I – Proposed Action

The proposed action is to conduct a chemical vegetation treatment in the South La Barge common allotment of approximately 300 acres. The legal location is T. 25 N., R. 114W., Sections 2-4,9-11,14-15 (see map Attachment A). This treatment would consist of aerially applied pelleted tebuthiuron (trade name Spike 20P) at a rate of 1-1.5 pounds per acre over 300

acres. At this application rate, approximately 50% of sagebrush plants are killed over a relatively long period of time (1-5 years). Aerial application would take one to two days to complete (with good weather conditions) and could be applied at any time of the year as long as there is no snow cover (and outside wildlife timing restrictions). It is usually applied in the fall. BLM staff would coordinate with the applicator hired to identify treatment boundaries and ensure project objectives are achieved. A working base for refueling and reloading the chemical would be located nearby to accomplish this project. Once the chemical has taken effect (usually 1-5 years) the project area would be hand-broadcast seeded with locally collected mountain shrub seed (antelope bitterbrush in particular) as well as a mix of native bunchgrasses and forbs. Additionally, an electric fence would be installed after seeding for two years to prevent livestock from using the treatment area. Total project cost is estimated at \$15,000.

Goals for this proposal are:

- 1) Reduce the amount of mountain big sagebrush from 30% cover to 10-15%, while leaving plant skeletons to help catch snow and protect understory vegetation response.
- 2) Improve forage quality for big game and livestock use.
- 3) Increase wildlife habitat diversity by providing a mosaic of successional vegetation stages, increased edge effect and shrub species diversity.
- 4) Reduce the possibility of a resource damaging wildfire by thinning heavy sagebrush fuel loading and allow for the reintroduction of fire at a lower intensity.

Standard Operating Procedures/Design Features

Livestock grazing would continue to follow the grazing management set forth for the South La Barge Common allotment. In compliance with the Pinedale Resource Management Plan section 2.3.11, objective #4 (page 2-39), no allotment rest would be required to achieve the objectives of this project. However, in order for the treated areas to recover more rapidly, livestock would be excluded by way of electric fence for a period of two years after the chemical takes effect on the sagebrush and supplemental seeding occurs.

The pre- and post-treatment vegetation conditions would be monitored by the wildlife, range and fuels staff of the Pinedale Field Office BLM and WGFD Habitat Biologists. Resource monitoring would include pre-treatment shrub density transects in Wyoming and mountain big

sagebrush, antelope bitterbrush, and true mountain mahogany communities. Additionally, a pre-treatment macroplot would be monitored for herbaceous and shrub species composition, ground cover and shrub density using point intercept and shrub belt methodologies. Several photopoints currently exist within the project area in addition to the vegetation monitoring points listed above. All shrub and macroplot transects would be monitored post treatment on years two, five and ten to document effects to herbaceous and shrub vegetation.

Activities potentially disruptive to wintering wildlife (i.e. treatment implementation) are prohibited during the period of November 15th to April 30th for the protection of big game winter habitat (elk and deer crucial winter range.) Because potential activities may disturb strutting and nesting greater sage grouse, they would be prohibited during the periods of March 15th through July 15th. Additionally, activities or surface use are not allowed from February 1 to July 31 for the protection of raptor nesting habitat.

Proper and safe aerial application of tebuthiuron on BLM lands would be strictly adhered to as required by federal, state and county procedures. Soil samples are required and have already been taken to determine appropriate application rates because the product is sensitive to the amount of clay and especially organic matter in the soil (Baxter 1998). A 500 foot untreated buffer around live water and associated riparian areas would be maintained.

A contingency plan for managing accidental releases or spills of any hazardous materials would be handled according to the BLM High Desert District Hazardous Materials Incident Contingency Plan and would abide by all applicable federal, state, local laws or regulations, and chemical label precautions. An approved Pesticide Use Proposal would be completed prior to chemical application. The applicator would provide pesticide application records for each day and a GPS (map) showing actual areas treated.

2.2 Alternative II – No Action Alternative

The no action alternative would leave the existing dense stands of mature big sagebrush as the dominant cover type and age-classes of all shrubs in mature to decadent condition. There would be little likelihood of increasing herbaceous vegetation, diversifying habitats and age-class structure, or improving overall watershed conditions. Hazardous fuels would continue to accumulate, increasing the likelihood of a wildfire ignition.

2.3 Alternatives Considered but not Analyzed in Detail

Alternatives Considered but not Analyzed in Detail

Prescribed Burn Treatment

Spring or fall prescribed burns could be implemented to remove big sagebrush and alter age-class and structural diversity. Burning could promote increases in shrub species diversity, and seeding could be used to improve the potential for expansion of other mountain shrubs. However vegetation in this precipitation zone could take much longer to recover from burning than chemical or mechanical treatments. Also prescribed fire would not be able to target specific species like chemical treatments can (i.e., tebuthurion targets sagebrush only) thus limiting the potential to achieve the project objectives.

All Mechanical Treatment (without any Chemical application)

Mechanical treatment of big sagebrush could be accomplished through a variety of methods on flatter terrain, and would result in a very precise treatment pattern with a lot of edge effect and release of grasses and forbs. However, the steeper slopes could not be treated safely with a mechanical treatment. Additionally, most mechanical treatments would not be able to target specific species like chemical treatments can (i.e., tebuthurion targets sagebrush only) thus limiting the potential to achieve the project objectives.

Alternate locations

Several other polygons were selected as potential treatment areas but were dropped from further analysis due to the lack of suitable soil conditions and a vegetative makeup that would not allow for project objectives to be achieved.

3.0 AFFECTED ENVIRONMENT

The following mandatory elements are not present or will not be affected by the proposed action and therefore would not be further analyzed:

Air Quality

Areas of Critical Environmental Concern (ACEC)

Environmental Justice
Prime or Unique Farmlands
Flood Plains
Hazardous or Solid Wastes
Traditional Cultural Properties
Water Quality-Drinking/Ground
Wetlands and Riparian Zones
Wild and Scenic Rivers
Fish Habitat
Forests
Wilderness/WSA/ACEC

3.1 Resources

3.1.1 Soils/Watershed

The NRCS provided information for an on-going 3rd order soil survey for the Sublette and Lincoln County area that included a soil map that contained soil map units and a database with detailed soil reports that included soil physical and chemical properties. The proposed locations are located in soil map units 2405 and 5527 (Appendix B). The soil map unit 2405 is a very deep, well drained upland soil, found on 5 to 15 percent slopes. The soil map unit 5527 is a shallow to very deep, well drained upland soil, found on 8 to 45 percent slopes. The southernmost polygon has no available soil data. However, its location indicates that it may be similar to the northern polygon. The average annual precipitation is 10 to 14 inches. The organic matter ranged from 2.3 to 3.9 percent. The Muddy Creek drainage is characterized as highly erodible lands that may create gullies where little plant material exists, to capture surface water movement.

3.1.2 Rangelands/ Upland Vegetation

Based on pre-treatment monitoring data (see appendix C) the shrub community in this geographic area is dominated by mountain big sagebrush and green rabbitbrush. Shrub belt transects indicate that the majority of plants are either mature or decadent. A variety of forbs and

grasses were also observed with hollyleaf clover and Sandberg bluegrass as the dominant species.

3.1.3 Wildlife/Migratory Birds

The shrub community in and around the project area demonstrates little age class diversity and limited regeneration. According to the priority ranking criteria, this area is considered high priority, in recognition of the sagebrush communities need for disturbance and the importance of this area to mule deer in the winter months. Management recommendations to achieve these desired outcomes include evaluate grazing practices, water developments, evaluate wildlife browsing, mechanical thinning and herbicide treatments (Mule Deer Habitat Assessment Report 2008).

The project area is identified as crucial winter range for mule deer and elk. Mule deer, antelope, and moose can also be found in the area during spring, summer, and fall. Other commonly observed species include coyote, badger, cottontail and jackrabbits, and various songbirds that utilize Wyoming and Mountain big sagebrush, mountain shrub, and aspen woodland habitats.

Raptors in the area include northern harrier, red-tailed, Swainson's hawks, Northern goshawks, Coopers hawks, sharp-shinned hawk, prairie falcon, golden eagles, and American kestrels. Owls in the area include: long-eared owl, short-eared owl, and great horned owl.

3.1.4 Threatened, Endangered, and Sensitive Species

Threatened, Endangered, and Proposed species may be present in the project area. These include the Canada lynx, gray wolf, and Greater Sage-Grouse.

Canada lynx- The project falls within the La Barge Creek lynx analysis unit which is approximately 61,294 acres in size. However, no designated critical habitat, foraging habitat, or denning habitat is contained within the project boundary.

Gray wolf- This area may be part of the home range for gray wolves.

Greater Sage-Grouse- Currently listed as "Warranted but Precluded" by the United States Fish and Wildlife Service, the Greater Sage-Grouse inhabits land encompassed by the project area. There are 6 sage grouse leks within 2 miles of the treatment and the area provides some nesting

and early brood rearing habitat. The proposed treatment area is not identified as Core or Key habitat for greater sage-grouse.

Sensitive species observed or likely to be found within the proposed project area include: ferruginous hawk (one nest within 1 mile), pygmy rabbit, sage thrasher, loggerhead shrike, Brewer's sparrow, and sage sparrow.

No known threatened or endangered plants occur within the project area.

3.1.5 Cultural Resources/Native American Religious Concerns

The proposed Muddy Creek Spike Treatment project area is located within a cultural sub region described in the 2008 BLM FEIS for the Pinedale Field Office as "The LaBarge Uplift" (2008 BLM, 3.3.2). This area is known to contain sparse concentrations of cultural resources primarily associated with prehistoric use of the wildlife migration corridor for big game procurement and is known to contain high number of stone circle sites. A number of different significant site types are known within the LaBarge Uplift area including 48SU354 (Calpet Rockshelter), 48SU595 (Birch Creek Site), 48SU1011 (Overlook Stone Circle) and 48SU828/861 (Lake Ridge Chert Quarries). These sites represent a diverse range of prehistoric activities in the region. Lithic resource procurement is known to be widespread throughout the LaBarge Uplift, primarily the fine grained cherts that can be found in specific locales such as 48SU828. This type of proposed project (herbicide treatment) is limited in its potential to adversely affect cultural resources. The proposed project area has not been previously inventoried for cultural resources. The BLM PFO has conducted multiple Native American consultations with the Northern Ute, Eastern Shoshone, Shoshone-Bannock and Northern Arapaho tribes in support of previous BLM planning documents (2008 PFO RMP, LaBarge Infill EIS) that include lands within the currently proposed project area. These lands have not previously been identified as being of special religious significance to these Native American tribes. The 2007 *BLM Vegetation Treatments Using Herbicides Final Programmatic EIS* notes that herbicide treatments used to control invasive species are a benefit to maintaining historic landscapes (4-146).

3.1.6 Recreation, Visual Resources

Recreation within the proposed project area consists of dispersed hunting, camping, and sightseeing. There are no developed recreation sites within the project area.

The project area is designated as a VRM Class III. “VRM Class III areas would be managed to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape (US DOI 2008).”

3.1.7 Livestock Grazing

The project area lies within the South La Barge Common allotment. There are 7 permittees and 12,124 AUMs (animal unit months) in this allotment. The season of use is May 1 through October 31.

3.1.8 Lands with Wilderness Characteristics (LWC)

The Muddy Creek Spike project falls within the LWC Area Inventory Unit # WYD01-6300-420 which was determined to contain land with wilderness characteristics in 2011.

3.1.9 Global Climate Change

Climate change is a long-term change in the statistical distribution of weather patterns over periods of time that range from decades to millions of years. It may be a change in the average weather conditions, or in a change of the distribution of events around that average (e.g., more or fewer extreme weather events). Climate change may be limited to a specific region, or may occur across the whole Earth.

3.1.10 Invasive/non-native species

There are no known occurrences of invasive/non-native plant species in the Muddy Creek Spike project boundaries; however, some cheatgrass has been observed in nearby areas.

4.0 ENVIRONMENTAL EFFECTS

4.1 Direct and Indirect Effects

4.1.1 Soils/Watershed Health

Alternative I – Proposed Action

The United States Department of Agriculture Natural Resource Conservation Service (USDA-NRCS) has calculated the tolerable soil loss (see appendix B for the “T factor”), produced through the soildb_WY723_635_041_02232011.mdb furnished by the USDA NRCS) for these soil map units. The tolerable soil loss in tons per acre per year are 5 for soil map unit 2405 and 1 to 3 for soil map unit 5527, for the northern polygon. No data available for the southern most polygon however, these two soil map units may be what the southern polygon consists of based on the repeating land forms. Soil map units have variable tolerable soil loss because there are more than one soil series within a soil map unit and each soil series may have a different value for tolerable soil loss. Both soil map units are defined as having highly erodible lands, calculated from the wind erodibility index and tolerable soil loss. The actual amount of erosion that would occur would depend on wind, rainfall, soil erodibility, slope length and gradient, plant cover, and erosion control practices. Percent reduction in sage brush is not expected to significantly increase erosion because of the slow rate that the sage brush dies off; plus, the skeleton of the sage brush that is left behind, may remain long enough for other plant species to move in while maintaining soil integrity.

Alternative II – No Action Alternative

Under the no action alternative, there would be no change to current soil conditions.

4.1.2 Rangelands/Upland Vegetation

Alternative I – Proposed Action

The chemical application would result in the death of entire sagebrush plants or a portion of the larger branches, reducing total canopy cover by approximately 50 percent. Skeletons that are left may provide residual cover and litter for many years that helps to trap snow. When the sagebrush canopy cover is reduced, diversity of plant communities could increase. This

treatment would be used to diversify the successional state of upland plant communities, primarily mature to decadent sagebrush stands. The proposed action would improve the health of upland vegetation by increasing the diversity of age-class and vertical structure within Mountain big sagebrush communities. Sagebrush treated with tebuthiuron would usually defoliate and refoliate several times before complete kill. The length of time needed to completely kill a sagebrush plant is largely dependent on rainfall patterns and available moisture. This could be anywhere from 1 to 5 years.

Tebuthiuron is a relatively non-selective herbicide absorbed by plant roots through the soil, and disrupts photosynthesis by blocking electron transport and the transfer of light energy. Tebuthiuron can influence the production and species composition proportions of herbaceous vegetation both directly, (by suppressing or promoting some species) and indirectly, (release from competitive effects of big sagebrush). The strength of this herbicide is its use as a habitat modifier in the BLM sagebrush management program. At low rates of application, tebuthiuron is used to thin sagebrush, creating a more favorable habitat for sagebrush dependent species. Forage release, (increase in the numbers and vigor of existing herbaceous plants) in response to tebuthiuron treatment may not occur until the second or third growing season following application. It is also important to note, that important wildlife browse species such as bitterbrush, mahogany, and snowberry would not be affected by tebuthiuron at the proposed application rate.

Livestock would be fenced from using the treatment area for two years after the chemical takes effect, allowing for project objectives for upland vegetation to be achieved.

Alternative II – No Action Alternative

Long-term plant succession in a mature to decadent condition would continue. This results in high densities of mature/decadent mountain big sagebrush with little to no age class variability or structure, relatively low upland production of herbaceous vegetation, reduced productivity and availability of forage, and greater use by ungulates in riparian habitats. Herbaceous vegetation within shrub stands would most likely continue to decline as competition from shrubs increases and grasses are increasingly outcompeted. Diversity in shrub cover and age-class structure would continue to be dependent on drought cycles, disease, and the longevity of big sagebrush in

this particular region. Long term benefits from vegetation age-class structure and composition stratification would not occur.

4.1.3 Wildlife/Migratory Birds

Alternative I – Proposed Action

The objectives of the Proposed Action are to improve wildlife habitat over the long-term by providing a more diverse mixture of plant species to select from and increase inter-community diversity while stabilizing this portion of the watershed complex. Quality, quantity, and availability of forage for all ungulate species, specifically mule deer, using the area for transitional and crucial winter range is expected to increase. This habitat treatment could also decrease the potential of comingling of wildlife and livestock thereby decreasing the potential for transmission of disease.

Wildlife may be temporarily displaced during the treatment and there may be indirect impacts for big game as well as small mammals and birds due to a short-term loss of some sagebrush. However, spike treatments in similar habitat types and precipitation zones have shown measurable increases in mountain shrubs, grasses and forbs over time. Thus, the long term benefits of these projects are expected to greatly exceed any potential short term negative impacts on wildlife.

Changes in vegetation composition would depend upon soil moisture conditions and could be seen over a period of 1-5 years depending on precipitation patterns. This gradual process allows wildlife to adjust to habitat changes over an extended period of time. Much of the area proposed for treatment is used during both winter and during transitional times for big game moving to spring/summer habitat. The potential to improve the survival of these species is higher by conducting treatments in transitional ranges to improve animal health and fat buildup before animals move onto crucial winter range. In the long-term, the overall project area (modified to a mixture of older/mature and rejuvenated/younger stands of shrubs) would provide much higher nutritional value and become more palatable due to the presence of younger shrub stands and reproducing seedlings. The thinning of the older, mature to decadent shrubs and sagebrush stands would create better overall mule deer habitat by creating a greater mixture of age class and structural diversity within the shrub communities.

Stratifying age structure in shrub communities would benefit both plant and wildlife species diversity. Additionally, big sagebrush skeletons remain for many years after treatment with tebuthiuron. These skeletons are important perch sites for a variety of birds, and remain to provide nesting and hiding cover. Other wildlife species in the project area including small reptiles, ground squirrels, mice, voles, and rabbits would also benefit from the improved diversity in plant structure and herbaceous production. Habitat would be altered from primarily older aged-class shrub stands to a heavier herbaceous component with younger shrub seedlings and sprouts, which would gradually mature and move towards a later seral stage, interspersed with islands and fingers of unaffected older aged shrubs and vegetation. This increased edge effect and more diverse habitat would support a greater number and diversity of wildlife species.

Wildlife would be exposed to very low levels of tebuthiuron following application. The clay pellets are odorless, unpalatable, and unattractive to wildlife for consumption. However, any tebuthiuron ingested by either wildlife or livestock is excreted rapidly. Neither tebuthiuron nor its metabolites accumulate in animals. Several types of herbicides have been analyzed for wildlife risks (US DOI 1991). The LD50 is given for several types of wildlife species and the expected dose according to different habitat type application rates. LD50 is the dosage of toxicant, expressed in milligrams of toxicant per kilogram of animal body weight, required to kill 50 percent of the animals in a test population when given orally. The lower the LD50 the greater the toxicity of the chemical. A dose is the amount of herbicide that actually enters the body. Doses below the 1/5 LD50 level are assumed to present a low or negligible risk.

TABLE 1

Risk Comparison of Estimate Wildlife Doses
From Tebuthiuron to Toxicity Reference Levels

| Representative Species | Expected Doses (mg/kg) | 1/5 LD50 (mg/kg) | LD50 (mg/kg) |
|-----------------------------------|-----------------------------------|-----------------------------|-------------------------|
| Sage Grouse | .315 | 100 | >500 |
| Grasshopper Mouse | 5.34 | 106 | >528 |
| Pronghorn | .494 | 106 | >528 |
| Coyote | .158 | 100 | >500 |
| Horned Lizard | .708 | 400 | >2,000 |
| Rocky Mountain Toad | 2.91 | 400 | >2,000 |
| Beef Cow | .143 | 106 | >528 |

At low rates of application, tebuthiuron is used to thin shrubs, creating a more favorable habitat for shrub-dependent species. Because this application often takes place on land with a low concentration of grass forage, risks to mammalian herbivores associated with its use might be lower than those predicted under the ingestion scenarios, and wildlife forage and habitat could be enhanced by these applications.

Alternative II – No Action Alternative

Under the no action alternative, wildlife species such as mule deer that rely on healthy stands of mixed mountain shrubs and diverse understory would continue to decline in their use of this general area. Under this alternative, the potential to improve the quality of winter and transitional habitat to help improve the survival of big game species would not occur. Additionally, it is likely that sage grouse use in the area would not increase. Potential for larger scale wildfires could increase with more intense burning conditions, potentially resulting in greater displacement and loss of habitat for sagebrush dependent species.

4.1.4 Threatened, Endangered, Proposed, and Sensitive Species

Alternative I – Proposed Action

Canada Lynx- Although this project is within an LAU, it is very unlikely that a lynx would occur in the project area as it is completely void of forested habitat associated with lynx. This project would be a “no affect” determination on Canada Lynx as no foraging or denning habitat would be disturbed.

Gray wolf – Wolves would likely avoid the project area during the implementation phase. Occupation of the area long term could potentially increase as prey abundance increases in the area. The Proposed Action would not jeopardize the continued existence of gray wolves.

Greater Sage-Grouse- By thinning the older, denser, decadent shrub stands, upland foraging, nesting, and early brood rearing areas could be improved for greater-sage grouse because of the increase in herbaceous diversity and cover. In the long term, the treatment has the potential to promote better habitat conditions in terms of both shrub cover and grass/forb cover and production. Initially, however, cover for nesting could be temporarily reduced in the treated portions.

Sensitive Species- Stratifying age structure in shrub communities would benefit both plant and wildlife species diversity. Additionally, big sagebrush skeletons remain for many years after treatment with tebuthiuron. These skeletons are important perch sites for a variety of birds, and remain to provide nesting and hiding cover. Other wildlife species in the project area including small reptiles, ground squirrels, mice, voles, and rabbits would also benefit from the improved diversity in plant structure and herbaceous production. Habitat would be altered from primarily older aged-class shrub stands to a heavier herbaceous component with younger shrub seedlings and sprouts, which would gradually mature and move towards a later seral stage, interspersed with islands and fingers of unaffected older aged shrubs and vegetation. This increased edge effect and more diverse habitat would support a greater number and diversity of wildlife species.

Alternative II – No Action Alternative

Threatened, Endangered, Proposed, and Sensitive Species with habitat linked to healthy mountain shrub communities may not improve in the long term under the No Action Alternative.

4.1.5 Cultural Resources/Native American Religious Concerns

Alternative I – Proposed Action

This type of proposed project (herbicide treatment) is limited in its potential to adversely affect cultural resources. The tebuthiuron treatment would be an aerial application and would not result in any surface disturbance. The surface sediments in the area are residual in nature and are unlikely to contain buried cultural deposits. The 2007 *BLM Vegetation Treatments Using Herbicides Final Programmatic EIS* notes that herbicide treatments used to control invasive species are a benefit to maintaining historic landscapes (4-146). The State Protocol between the Wyoming BLM and the Wyoming SHPO lists herbicide treatments that are unlikely to affect rock art or traditional Native American plant gathering areas as an action exempt from case-by-case review (2006 State Protocol, Appendix B). The proposed project area is not known to contain nor does it have the potential (no rock exposures) to contain any rock art. Native American consultation was undertaken with the Northern Arapahoe, Eastern Shoshone, Shoshone-Bannock and Northern Ute business councils to gather input as to any issues with the project. No comments were received from the consulted parties. The State Protocol between the Wyoming BLM and the Wyoming SHPO also notes that new fence construction and modifications of existing fence lines that do not require disturbance beyond placement of poles

and will not result in the concentration of animals or creation of two track roads can be an action exempt from case-by case review, as determined by the BLM cultural resource specialist (State Protocol, Appendix B). The fencing proposed for this project would be temporary exclosures for vegetation treatment areas and would not result in concentration of livestock or the creation of two-track roads. As such, the use of temporary fencing to exclude livestock from the treatment area would not create the potential to adversely impact significant cultural resources. No Class III inventory of the proposed project area was required to assess the project's potential to impact cultural resources as no subsurface disturbance is proposed and the project has no potential to adversely affect NHPA eligible sites in the project area. This project, as currently proposed, would result in no effects to significant cultural resources.

Alternative II – No Action Alternative

Cultural resource sites would not be disturbed. There would be no direct or indirect effects to significant cultural resources in the proposed project area if the "No Action" alternative is chosen. The current stable sagebrush community of plants would continue to prevent soil erosion that has help stabilize any cultural bearing sediments in the area.

4.1.6 Recreation, Visual Resources

Alternative I – Proposed Action

Recreation

Chemical treatment could potentially have a short term impact on recreation during the actual application period due to disturbance from aircraft applying the chemical. The short-term nature of the application would minimize this impact, which may not happen at all if the application did not occur during the principle hunting seasons.

Visual Resources

Chemical treatment would meet the objective of class III, which is to partially retain the existing character of the landscape. The level of change to the characteristic landscape would be moderate. Management activities may attract attention, but would not dominate the view of the casual observer.

Alternative II – No Action Alternative

Recreation

Under the no action alternative there would be no impacts to current recreational opportunities.

Visual Resources

No change to the VRM class would occur as a result of this action.

4.1.7 Livestock Grazing

Alternative I – Proposed Action

Negative impacts to livestock would be unlikely with the intended use of tebuthiuron. Cattle use in the eastern portion of the South La Barge Common allotment (where the proposed action is located) is highly dependent on proximity to a water source. Due to the lack of water in near the project area, it is unlikely that livestock use in the area would increase due to the treatment. Livestock would be fenced out of the project area for two years after the treatment takes effect. There would be no allotment-wide rest required to achieve project objectives. The normal schedule of cattle turn out in early May would still occur.

Alternative II – No Action Alternative

Under the no action alternative, there would be no change to current livestock grazing

4.1.8 Lands with Wilderness Characteristics (LWC)

Alternative I – Proposed Action

The proposed vegetative treatment would not impair wilderness qualities of LWC Unit # WYD01-6300-420. The treatment would not result in man-made structures, road building, or other associated surface disturbing activities causing a visible imprint of man. Project design features such as the aerial application of Spike 20P at a 50% sagebrush canopy reduction level would result in a patchy mix of live sagebrush and dead sagebrush skeletons. Live undergrowth would quickly become established under the dead sagebrush skeletons emulating natural looking conditions on the treated areas. LWC unit size, naturalness, solitude, and/or primitive-unconfined recreation would remain unaffected.

Alternative II – No Action Alternative

Under the No Action Alternative no surface disturbing activities or other associated project activities resulting in a visible imprint of man would occur to affect the LWC unit size, its naturalness, solitude, and/or primitive-unconfined recreation. LWC status would be unaffected.

4.1.9 Global Climate Change

Alternative I – Proposed Action

The project would have no effect on global climate change.

Alternative II – No Action Alternative

Under the no action alternative, there would be no effect on global climate change.

4.1.10 Invasive/non-native species

Alternative I – Proposed Action

This project would not contribute to the existence of invasive/non-native species in the area.

There are currently no known invasive/non-native species in the project area. Based on the thinning application of this project and the supplemental seeding that is planned, there shouldn't be a niche opened up for other species to establish.

Alternative II – No Action Alternative

Under the no action alternative, invasive/non-native species would continue to persist at the current rate.

4.2 Cumulative Effects (Chapter 6.8.3, pg.57 & Ch. 6.8.3.5, pg. 59)

Although there are no active oil or gas wells currently in or around the project area, this area is leased for mineral extraction. One well is proposed at this time. There have been no other known past, present, or foreseeable future impacts in the project area that have not already been analyzed in this document.

4.3 Mitigation Measures Considered

4.3.1 Description of Mitigating Measures and Residual Impacts

No additional mitigation measures would be required, beyond those presented in the proposed action. Since no additional mitigation measures have been proposed, there would be no residual impacts.

5.0 SCOPING

Individuals Scoped on this proposal are included in Appendix D.

5.1 LIST OF PREPARERS

| <u>Authors & Reviewers</u> | <u>Title</u> | <u>Assignment</u> |
|--------------------------------|--------------------|-------------------|
| Rusty Kaiser | Wildlife Biologist | Author |
| Greg Reser | Fuels Specialist | Author |

5.2 List of BLM Reviewers

| | | |
|----------------|-------------------------------------|--------|
| Deej Brown | Weeds Specialist | Review |
| Amber Robbins | Rangeland Specialist | Review |
| Rob Schweitzer | Archeologist | Review |
| Brian Roberts | Soils | Review |
| Martin Hudson | Recreation Specialist | Review |
| Jim Glennon | Botanist | Review |
| John Huston | Assistant Field Manager (Resources) | Review |

5.3 List of Non-BLM Reviewers

| | | |
|-------------------|------------------------------------|--------|
| Gary Butler | WGFD Habitat Biologist Supervisor | Review |
| Jeff Short | WGFD Wildlife Biologist | Review |
| Ron Lockwood | WGFD Terrestrial Habitat Biologist | Review |
| Jill Miller | WGFD Terrestrial Habitat Biologist | Review |
| Adrianne Peterson | Sublette County Weed and Pest | Review |

6.0 References

Baxter, G. 1998. Thinning dense sagebrush stands with Spike 20P. *Rangelands* 20:14–16.

Smith, Megan and Brenda Younkin. 2010. Wyoming Range Mule Deer Habitat Assessment: South LaBarge Study Area. Teton Science Schools. Jackson, WY.

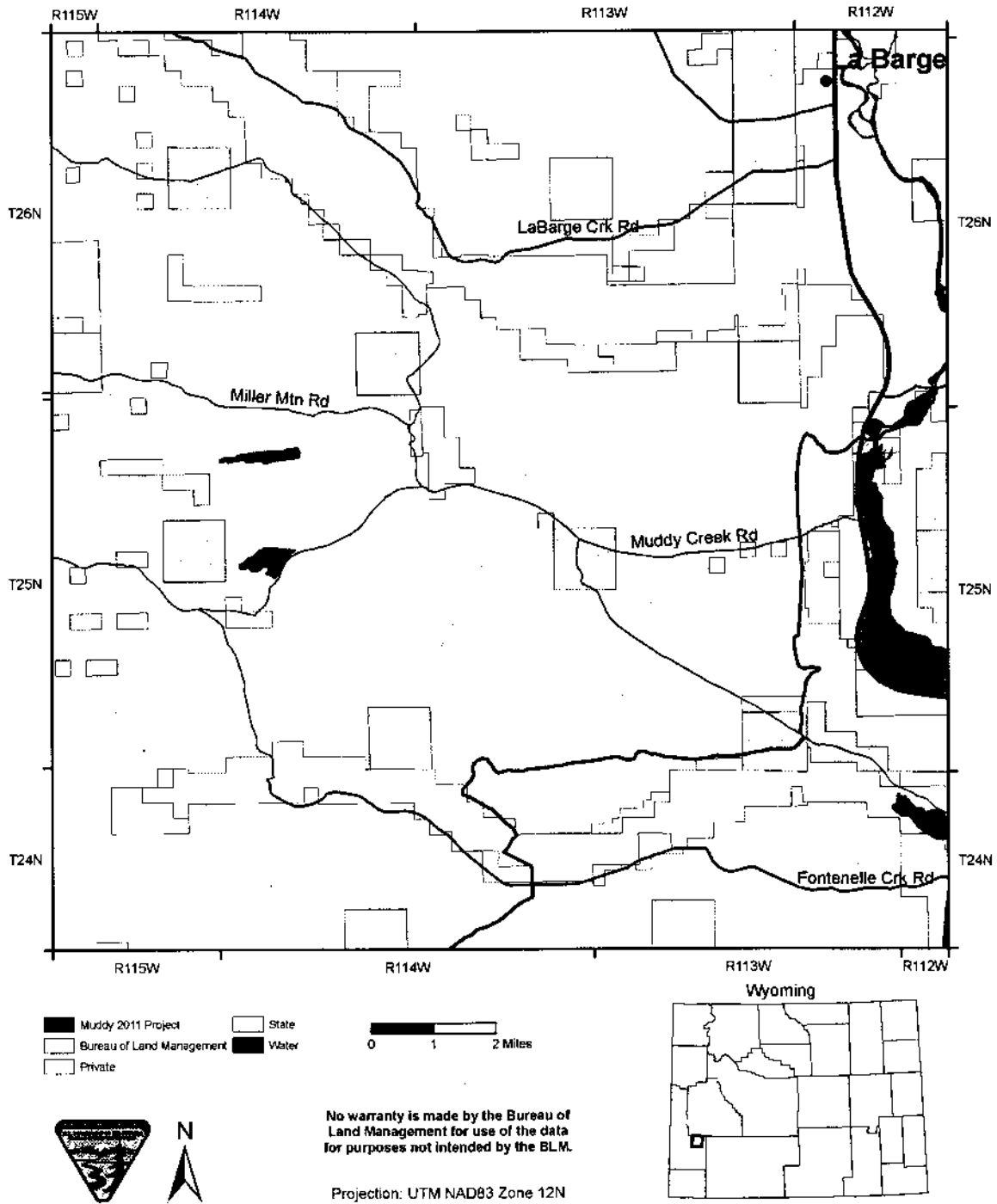
U.S. Department of Interior, Bureau of Land Management. 1991. Final Environmental Impact Statement: Vegetation Treatment on BLM Lands in Thirteen Western States.

U.S. Department of Interior, Bureau of Land Management. 2007. Final Programmatic Environmental Impact Statement: Vegetation Treatments Using Herbicides on BLM Lands in Seventeen Western States.

U.S Department of Interior, Bureau of Land Management. 2008. Record of Decision and Approved Pinedale Resource Management Plan.

Appendix A

Muddy Creek Spike Project



Appendix B

Map Unit Descriptions (WY)

Lincoln County Area, Wyoming, Southern Part

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

2405--Mantlemine-Weed complex, 5 to 15 percent slopes

Mean annual precipitation: 10 to 14 inches

Mean annual temperature: 34 to 38 degrees F

Frost-free period: 30 to 60 days

Mantlemine and similar soils

Extent: about 85 percent of the unit

Landform(s): alluvial fans, fan aprons, intermontane basins

Slope gradient: 5 to 15 percent

Parent material: slope alluvium derived from sandstone and shale

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Ecological site(s): ---

Soil loss tolerance (T factor): 5

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 86

Land capability class, nonirrigated: 6s

Drainage class: well drained

Hydric soil: no

Hydrologic group: B

Potential frost action: moderate

Representative soil profile:

| | | Texture |
|-------|-------------|---------------|
| A | 0 to 3 in | sandy loam |
| Bt | 3 to 11 in | loam |
| Btknz | 11 to 26 in | loam |
| Bknz1 | 26 to 49 in | loam |
| Bknz2 | 49 to 79 in | gravelly loam |

| Permeability | Available water capacity | pH | Kw | Kf |
|--------------|--------------------------|------------|-----|-----|
| moderate | 0.3 to 0.4 in | 7.9 to 8.4 | .20 | .20 |
| moderate | 1.3 to 1.4 in | 7.9 to 8.4 | .28 | .28 |
| moderate | 2.0 to 2.2 in | 8.5 to 9.0 | .32 | .32 |
| moderate | 2.6 to 3.1 in | 8.5 to 9.0 | .32 | .32 |
| moderate | 3.2 to 3.8 in | 8.5 to 9.0 | .20 | .32 |

Weed and similar soils

Extent: about 15 percent of the unit

Landform(s): alluvial fans, fan aprons, intermontane basins

Slope gradient: 5 to 15 percent

Parent material: slope alluvium derived from sandstone and shale

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Ecological site(s): ---

Soil loss tolerance (T factor): 5

Wind erodibility group (WEG): 5

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 6s

Drainage class: well drained

Hydric soil: no

Hydrologic group: B

Potential frost action: moderate

Map Unit Descriptions (WY)

Lincoln County Area, Wyoming, Southern Part

| Representative soil profile: | Texture | Permeability | Available water capacity | pH | Kw | Kf |
|------------------------------|---------|--------------|--------------------------|------------|-----|-----|
| A — 0 to 4 in | loam | moderate | 0.5 to 0.6 in | 7.4 to 7.8 | .24 | .24 |
| Bt1 — 4 to 15 in | loam | moderate | 1.8 to 2.1 in | 7.9 to 8.4 | .32 | .32 |
| Bt2 — 15 to 37 in | loam | moderate | 3.6 to 4.0 in | 7.9 to 8.4 | .28 | .28 |
| Bck1 — 37 to 59 in | loam | moderate | 3.5 to 3.9 in | 7.9 to 8.4 | .32 | .32 |
| Bck2 — 59 to 69 in | loam | moderate | 1.6 to 1.8 in | 7.9 to 8.4 | .32 | .32 |
| Bck3 — 69 to 79 in | loam | moderate | 1.6 to 1.8 in | 7.9 to 8.4 | .32 | .32 |

Minor Components

Map Unit Descriptions (WY)

Lincoln County Area, Wyoming, Southern Part

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

5527--Pensore-Mantlemine-Muddke complex, 8 to 45 percent slopes

Mean annual precipitation: 10 to 14 inches

Mean annual temperature: 34 to 38 degrees F

Frost-free period: 30 to 60 days

Pensore and similar soils

Extent: about 50 percent of the unit

Landform(s): escarpments, intermontane basins, ridges

Slope gradient: 8 to 45 percent

Parent material: slope alluvium over residuum weathered from mudstone

Restrictive feature(s): lithic bedrock at 8 to 20 inches

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Ecological site(s): ---

Soil loss tolerance (T factor): 1

Wind erodibility group (WEG): 4L

Wind erodibility index (WEI): 86

Land capability class, nonirrigated: 6s

Drainage class: well drained

Hydric soil: no

Hydrologic group: D

Potential frost action: moderate

Representative soil profile:

| | Texture | Permeability | Available water capacity | pH | Kw | Kt |
|-------------------|--------------------|-----------------|--------------------------|------------|-----|-----|
| A -- 0 to 4 in | loam | moderate | 0.6 to 0.8 in | 8.5 to 9.0 | .37 | .37 |
| Bkn -- 4 to 14 in | very channery loam | moderate | 0.9 to 1.0 in | 8.5 to 9.0 | .17 | .43 |
| R -- 14 to 39 in | bedrock | moderately slow | | | | |

Muddke and similar soils

Extent: about 20 percent of the unit

Landform(s): escarpments, intermontane basins, ridges

Slope gradient: 8 to 45 percent

Parent material: slope alluvium over residuum weathered from mudstone

Restrictive feature(s): lithic bedrock at 39 to 59 inches

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Ecological site(s): ---

Soil loss tolerance (T factor): 3

Wind erodibility group (WEG): 2

Wind erodibility index (WEI): 134

Land capability class, nonirrigated: 6s

Drainage class: well drained

Hydric soil: no

Hydrologic group: A

Potential frost action: moderate

Map Unit Descriptions (WY)
Lincoln County Area, Wyoming, Southern Part

| <i>Representative soil profile:</i> | <i>Texture</i> | <i>Permeability</i> | <i>Available water capacity</i> | <i>pH</i> | <i>Kw</i> | <i>Kf</i> |
|-------------------------------------|-----------------------------------|---------------------|---------------------------------|------------|-----------|-----------|
| A -- 0 to 4 in | loamy very fine sand | rapid | 0.3 to 0.4 in | 7.9 to 8.4 | .49 | .49 |
| Bt -- 4 to 14 in | very fine sandy loam | moderately rapid | 1.4 to 1.6 in | 7.9 to 8.4 | .43 | .43 |
| Bk -- 14 to 21 in | very fine sandy loam | moderately rapid | 1.0 to 1.2 in | 7.9 to 8.4 | .43 | .43 |
| Bkn -- 21 to 41 in | very fine sandy loam | moderately rapid | 2.8 to 3.2 in | 8.5 to 9.0 | .43 | .43 |
| BCKn -- 41 to 53 in | paragravelly very fine sandy loam | moderately rapid | 1.3 to 1.4 in | 8.5 to 9.0 | .49 | .49 |
| R -- 53 to 79 in | bedrock | moderately slow | | | | |

Mantlemine and similar soils

Extent: about 20 percent of the unit

Landform(s): escarpments, intermontane basins, ridges

Slope gradient: 8 to 45 percent

Parent material: slope alluvium derived from mudstone

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Ecological site(s): --

Soil loss tolerance (T factor): 3

Wind erodibility group (WEG): 4L

Wind erodibility index (WEI): 86

Land capability class, nonirrigated: 6s

Drainage class: well drained

Hydric soil: no

Hydrologic group: B

Potential frost action: moderate

| <i>Representative soil profile:</i> | <i>Texture</i> | <i>Permeability</i> | <i>Available water capacity</i> | <i>pH</i> | <i>Kw</i> | <i>Kf</i> |
|-------------------------------------|-----------------------|---------------------|---------------------------------|------------|-----------|-----------|
| A -- 0 to 4 in | loam | moderate | 0.6 to 0.8 in | 7.9 to 8.4 | .37 | .37 |
| Bt -- 4 to 10 in | loam | moderate | 0.9 to 1.1 in | 7.9 to 8.4 | .32 | .32 |
| Btk -- 10 to 17 in | very gravelly loam | moderate | 0.6 to 0.7 in | 7.9 to 8.4 | .15 | .37 |
| Bkk -- 17 to 29 in | very gravelly loam | moderate | 1.1 to 1.3 in | 7.9 to 8.4 | .15 | .37 |
| BCK -- 29 to 79 in | extremely flaggy loam | moderate | 3.5 to 5.0 in | 7.9 to 8.4 | .10 | .37 |

Minor Components

Appendix C

Muddy Cr Spike Line Point Intercept Summary Data- South Polygon

| Shrub species | Common name | Code | % Canopy |
|--------------------------------------|--------------------|-------|----------|
| <i>Artemisia tridentata vaseyana</i> | Mtn. big sagebrush | ARTRV | 30.0% |
| <i>Chrysothamnus viscidiflorus</i> | Green rabbitbrush | CHVI8 | 6.4% |
| <i>Tetradymia canescens</i> | Gray horsebrush | TECA2 | 0.8% |

| Grass species | Common name | Code | % Canopy |
|-------------------------------|-----------------------|-------|----------|
| <i>Achnatherum hymenoides</i> | Indian ricegrass | ACHY | 1.2% |
| <i>Carex</i> spp. | Sedge | CAREX | 5.6% |
| <i>Elymus elymoides</i> | Squirreltail | ELEL5 | 2.0% |
| <i>Elymus lanceolatus</i> | Thickspike wheatgrass | ELLA3 | 2.8% |
| <i>Poa secunda</i> | Sandberg's bluegrass | POSE | 8.0% |

| Forb species | Common name | Code | % Canopy |
|--------------------------------|------------------------|--------|----------|
| <i>Antennaria rosea</i> | Rosey pussytoes | ANRO2 | 1.6% |
| <i>Astragalus convallarius</i> | Lesser rushy milkvetch | ASCO12 | 1.2% |
| <i>Erigeron</i> spp. | Daisy | ERIGE2 | 0.4% |
| <i>Eriogonum caespitosum</i> | Matted buckwheat | ERCA8 | 0.8% |
| <i>Linanthus pungens</i> | Granite prickly phlox | LIPU11 | 2.4% |
| <i>Cordylanthus ramosus</i> | Bushy bird's beak | CORA5 | 1.2% |
| <i>Phlox hoodii</i> | Carpet phlox | PHHO | 0.8% |
| <i>Phlox longifolia</i> | Longleaf phlox | PHLO2 | 1.6% |
| <i>Trifolium gymnocarpon</i> | Hollyleaf clover | TRGY | 4.4% |
| | Mustard | | 1.6% |

Vegetation data collected on the line-point intercept macro-plot transect indicating species composition and canopy cover.

Muddy Cr Spike Shrub Belt Monitoring Summary Data (Stems/Acre)- South Polygon

| Species | Common name | Code | Young | Mature | Decadent | Dead |
|--------------------------------------|----------------------|-------|-------|--------|----------|-------|
| <i>Artemisia tridentata vaseyana</i> | Mtn. big sagebrush | ARTRV | 64.7 | 4921.0 | 3399.4 | 906.5 |
| <i>Chrysothamnus viscidiflorus</i> | Green rabbitbrush | CHVI8 | 161.9 | 4856.2 | 2492.9 | 0 |
| <i>Krascheninnikovia lanata</i> | Winterfat | KRLA2 | 0 | 32.4 | 0 | 0 |
| <i>Purshia tridentata</i> | Antelope bitterbrush | PUTR2 | 0 | 32.4 | 0 | 0 |
| <i>Symphoricarpos oreophilus</i> | Snowberry | SYOR2 | 0 | 291.4 | 0 | 0 |
| <i>Tetradymia canescens</i> | Gray horsebrush | TECA2 | 0 | 97.1 | 129.5 | 0 |

Total stems per acre encountered by species and age class combined from five shrub belts using line-point intercept macro-plot method.

Muddy Cr Spike Ground Cover_ South Polygon

| | |
|------------|-------|
| Litter | 40.8% |
| Moss | 3.6% |
| Bare soil | 53.2% |
| Vegetation | 2.4% |

Ground cover data recorded along 250 points using line-point intercept macro-plot method.

Muddy Cr Spike Shrub Belt Monitoring Summary Data (Stems/Acre)- North Polygon

| Species | Common name | Code | Young | Mature | Decadent | Dead |
|--------------------------------------|-------------------|--------|--------|---------|----------|--------|
| <i>Artemisia tridentata vaseyana</i> | Mtn big sagebrush | ARTRW8 | 0.0 | 3108.0 | 1327.4 | 1100.7 |
| <i>Chrysothamnus viscidiflorus</i> | Green rabbitbrush | CHVI8 | 1424.5 | 14665.8 | 64.7 | 97.1 |
| <i>Symphoricarpos oreophilus</i> | Snowberry | SYOR2 | 2104.4 | 10748.5 | 97.1 | 0.0 |
| <i>Tetradymia canescens</i> | Gray horsebrush | TECA2 | 32.4 | 809.4 | 0.0 | 0.0 |
| <i>Artemisia nova</i> | Black sagebrush | ARNO4 | 0.0 | 97.1 | 0.0 | 0.0 |

Muddy Cr Spike Line Point Intercept Summary Data- North Polygon

| Shrub species | Common name | Code | % Canopy Cover |
|--------------------------------------|-------------------|-------|----------------|
| <i>Artemisia tridentata vaseyana</i> | Mtn big sagebrush | ARTRV | 19.6% |
| <i>Chrysothamnus viscidiflorus</i> | Green rabbitbrush | CHVI8 | 11.6% |
| <i>Tetradymia canescens</i> | Gray horsebrush | TECA2 | 1.2% |
| <i>Symphoricarpos oreophilus</i> | Snowberry | SYOR2 | 12.0% |
| <i>Artemisia nova</i> | Black sagebrush | ARNO4 | 1.2% |
| Shrub total | | | 45.6% |